

Mr. Baker starts out with the quotation of a leading ornithologist: "Of egg collectors we have many, of oölogists, alas! but very few," which he says is "a very true summing-up of the situation, however depressing it may be." He goes on to say that the basal idea of those egg collectors who have *some* object in view is to ascertain and record the color and description of the eggs of each species of bird, but he adds, all such preliminary work has already been done. The real work now is to discover the underlying reasons for coloration and peculiar shape and the method of adaptation and eliminative protection. There is also the study of relationship in egg structure between birds of different families and genera as an aid to working out the true classification of birds, as well as the study of geographic variation in eggs in connection with the range of the species and the recognition of subspecies.

"The crudest and most deservedly abused form of collector," says Mr. Baker, "is the man sets out with the ambition of filling one box or drawer with the eggs of one species. Such collections merely form a mass of beautiful dead things which gratify his eye and sense of possession." He also warns against making a specialty of abnormal sets for such a collection, while it may be very beautiful is "scientifically almost useless," since all scientific work must be done upon normal sets.

There are great opportunities for developing "oölogists" out of our host of "egg collectors" if they are guided in the right paths, and Mr. Baker's paper may be read with profit both by the collector and by those who are opposed to collecting. Incidentally the journal in which the paper appears, 'The Oologists' Exchange and Mart,'¹ is an admirable little publication dealing with the serious side of egg collecting and well worthy of perusal by American oölogists.—W. S.

Economic Ornithology in Recent Entomological Publications.—

Allusions by entomologists to the bird enemies of various insects are cited and discussed in the following paragraphs, each devoted to a different insect or group of insects.

False wireworms (*Elcodes*).—These are the larvae of beetles of the family Tenebrionidae, which are injurious in western states to grain, fruit and garden crops. The author of the paper reviewed² notes from various sources that Burrowing Owls, Butcher Birds, Crows, Crow Blackbirds and Red-headed Woodpeckers prey upon these beetles and further states that adults have been found by the Biological Survey in stomachs of 13 species of birds. This record may now be considerably improved. The most important economic species of false wireworm (*Elcodes tricolorata*) has been found in the stomachs of eight species of birds, as follows: Frank-

¹ The Oologists' Exchange and Mart. Kenneth L. Skinner, Editor, Brooklands Estate Office, Weybridge, England. Subscription, \$1.25 per year.

² McColloch, J. W. Journ. Ec. Ent., Vol. 11, No. 2, April 1918, pp. 219-220.

lin's Gull, Upland Plover, Red-headed Woodpecker, Lewis's Woodpecker, Crow (in 21 stomachs), Crow Blackbird, Meadowlark, and Curve-billed Thrasher. Various other species of *Eleodes* have been found to be eaten by the following 16 birds in addition to the eight just named: Avocet, Sparrow Hawk, Burrowing Owl, Great-horned Owl, Hairy Woodpecker, Red-shafted Flicker, Road-runner, Horned Lark, Arkansas Kingbird, Magpie, Brewer's Blackbird, Yellow-headed Blackbird, Loggerhead Shrike, Mockingbird, Sage Thrasher, and Robin. The total list of known bird predators on *Eleodes*, therefore, is now 24. Of these, the crow, magpie and roadrunner probably are the most effective.

Lotus borer (*Pyrausta penitalis*).—This moth larva feeds on a variety of plants but seems to damage man's interests only when feeding on the American lotus. The larvae frequently destroy every seed in the receptacle of this beautiful waterlily. In an account¹ of the species, Dr. F. H. Chittenden states that blackbirds are said to eat the larvae before they go into shelter. In July, 1919, the reviewer had an opportunity to observe an infestation of *Nelumbo* by this species at the Dardenne Lakes, Missouri, and the work of blackbirds against the pest. A large proportion of the receptacles of the water chinquapin were blasted and the exit holes of the larvae with the accompanying frass and silk gave a clue to the pests, good specimens of which were soon found. Red-winged Blackbirds were observed working at the receptacles and investigation showed they knew well how to dig out the larvae. All of the infested receptacles near the fringe of trees in which the birds perched, seemed to have been freed of the lotus-borers.

Round-headed apple-tree borer (*Saperda candida*).—Mr. Fred E. Brooks says that this species is the most destructive in the eastern United States of any of the several kinds of insects that injure apple-trees by boring into the bark and wood. Birds are the only important enemies, and the author states² that "Woodpeckers destroy great numbers of the borers by removing them from their burrows. . . . In some cases from 50 to 75 per cent. of the borers are destroyed in this way. . . . Probably both the hairy and downy woodpeckers feed on the borers." It should be noted that Mary Treat has definitely recorded³ that the Downy Woodpecker and Flicker feed upon this pest.

The Biological Survey has found beetles of the same genus as the apple-tree borer in stomachs of the Laughing Gull, Cassin's Kingbird, Magpie, Bluejay, Meadowlark, Red-eyed Vireo and Robin.

Flat-headed apple-tree borer (*Chrysobothris femorata*).—The same author quoted with reference to the preceding pest, notes⁴ that Woodpeckers devour also many flat-headed borers, and gives the names of three species

¹ Journ. Ec. Ent., Vol. II, No. 6, Dec. 1918, p. 457.

² Farmers' Bul. 675, U. S. Dept. Agr. Revised, Sept. 1919, p. 12.

³ Journ. N. Y. Ent. Soc., Vol. I, 1893, p. 17.

⁴ Farmers' Bul. 1065, U. S. Dept. of Agriculture, Oct. 1919, p. 9.

of birds, in the stomachs of which adults have been found by the Biological Survey. This list can now be increased to five species: the Kingbird, Crow, and the Red-eyed, Warbling, and Yellow-throated Vireos. Beetles of other species of the same genus have been found in stomachs of 11 kinds of birds, namely, the Downy, Hairy and Red-headed Woodpeckers, Kingbird, Phoebe, Wood Pewee, Crow, and the Red-eyed, Solitary, Yellow-throated and White-eyed Vireos.

Striped Cucumber Beetle (*Diabrotica vittata*).—While this is one of the pests that ravage truck crops every year, evidently not being appreciably checked by its enemies, still it is of interest to know what these are. One of the recent bulletins prepared in the Bureau of Entomology cites from Biological Survey records¹ the names of 15 bird enemies of the striped cucumber beetle. Two names can now be added to the list, viz.: Red-eyed and Philadelphia Vireos.

Grain bug (*Chlorochroa sayi*).—In recent years this species has become a pest of considerable importance in the Great Basin and Southwestern States, blasting the newly formed heads of cereals, to such an extent in some instances as to cause the crop to be cut for forage. Authors of a bulletin on this pest say:² "The offensive odor secreted by the scent glands of *Chlorochroa sayi* has been commonly supposed to protect them from the attacks of predatory enemies." However, the insect has "quite a variety of both vertebrate and invertebrate enemies." The Biological Survey is quoted as authority for reporting the grain bug from stomachs of the nighthawk and western meadowlark, and related species from the stomachs of five other species of birds. The latter list may now be increased to eight, including: Franklin's Gull, Bobwhite, Nighthawk, Kingbird, Magpie, Eastern Meadowlark, Brewer's Blackbird and English Sparrow.

White-grubs (*Phyllophaga*).—These are the larvae of the so-called May-beetles or June-bugs, the more familiar generic name for which is *Lachnosterna*. Their destructiveness, in grain fields, pastures, lawns and elsewhere need not be detailed here: suffice to it say they are among the most important insect pests and constantly receive the close attention of economic entomologists. Mr. John J. Davis, in a recent treatise³ of the natural enemies of *Phyllophaga*, says: "On account of the difficulty of controlling the common white grubs, which pass ninety-five per cent. of their life under ground, their natural enemies are of unusual importance to the farmer." It is of much interest, therefore, that the author in this formal treatise on the enemies of these pests, should state that: "Birds are

¹ Chittenden, F. H. Farmers' Bul. 1038, U. S. Dept. Agriculture, May 1919, p. 10.

² Caffrey, D. J., and Barber, Geo. W. Bul. 779, U. S. Dept. Agriculture, June 1919, p. 31.

³ Bull. Ill. Nat. Hist. Survey, Vol. 13, Art. 5, Feb. 1919, pp. 53-138. Pls. 3-15, 45 figs.

among the most efficient . . . more especially in the newer regions where they are still to be found in large numbers." He mentions 52 species of birds among which probably the crow and the crow blackbird are the most valuable. Mr. Davis has gathered together and abstracted most of the information in economic publications on the bird enemies of Phyllophaga, but his total of 52 species can be largely increased if we take into consideration unpublished records of the Biological Survey. Phyllophaga adults and larvae have been found in the stomachs of 83 species of birds of the United States. The common crow is pre-eminent as an enemy of both adults and larvae. Other birds especially worthy of mention in the latter role (from a total of 15 species) are the Upland Plover, Rusty Blackbird and Robin, and in the former (from a total of 81 species) the following named approximately in the order of their importance: Starling, Crow Blackbird, Meadowlark, Brown Thrasher, Robin, Nighthawk, Chuck-wills-widow, Whip-poor-will, Screech Owl, Kingbird, the five species of *Hylocichla*, and these ten of about equal rank: Red-winged Blackbird, Upland Plover, the two Cuckoos, Flicker, Blue-jay, Catbird, Red-headed Woodpecker, Mockingbird, English Sparrow, Magpie and Towhee.—W. L. M.

Pine-seed Eaters in British Garhwal.—An interesting note on this subject by A. E. Omaston, may be called to the attention of ornithologists. The Chir Pine (*Pinus longifolia*), says¹ the author, is a tree which produces large quantities of edible seeds, but it is eaten by so many animals that one is forced to marvel how sufficient seed survives to bring about the complete natural regeneration which is so characteristic of the species. In this case, as in many others, nature is lavish, providing against all possible losses. Birds mentioned as important consumers of Chir seeds are: Eastern Wood-pigeon (*Palumbus castotis*), a Nutcracker (*Nucifraga hemispila*), two species of Pied-Woodpeckers (*Dendrocopus himalayensis* and *D. auriceps*), and the Black and Yellow Grosbeak (*Pycnorhamphus icteroides*). The article contains also interesting notes on the local distribution and habits of these birds.—W. L. M.

The Ornithological Journals.

Bird-Lore. XXII, No. 1. January-February, 1920.

The Ring-Necked Pheasant. By Verdi Burtch.—Has become quite common in western New York, where it has taken the place of the Ruffed Grouse as a game bird.

Bobbie Yank. By Katrine Blackinton.—Account of a White-breasted Nuthatch.

¹ Indian Forester, Vol. 44, No. 10, Oct. 1918, p. 463.